

Initial	Date
CW	3-19-02

BA WTR
WR ND
Mail Stop 60189

MAR 19 2002

Memorandum

To: Project Leader, Tewaukon National Wildlife Refuge
From: Chief, Division of Water Resources, Region 6
Subject: 2001-2002 Annual Water Use Report/Management Plan

191 CHERYL C. WILLIS

The subject reports for Tewaukon and Storm Lake National Wildlife Refuges have been reviewed. The Tewaukon 2002 Plan will be forwarded to the State as the 2002 Operations Plan.

On future reports, the water rights list for Tewaukon NWR should include the December 27, 2001, application for prescriptive water right for 859 acre-feet storage in Lake Tewaukon, Cutler Marsh, East White Lake, and West White Lake plus adjustment of -3928 acre-feet from currently permitted seasonal use annually.

The Declaration of Filing for Storm Lake NWR lists storage of 729 acre-feet and seasonal use of 516 acre-feet NOT 522 acre-feet storage and 900 acre-feet seasonal as shown on your report. Please use the corrected information on future reports.

Attached is the signed approval page for your files.

Attachment

bcc:WR rf
RO rf
Refuges Supervisor (Shupe)
WTR:LCoe:lc:03/18/02
I:\WATERUSE\NO_DAKOTA\01-02\02TEWAUK.02



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Tewaukon National Wildlife Refuge Complex
9754 143½ Ave SE
Cayuga, ND 58013-9764

MEMORANDUM

To: National Wildlife Refuge System, ND/SD. MT Refuge Supervisor (60100)
Denver, CO

From: Refuge Manager, Tewaukon NWR Complex (62660) *Dave Staller*
Cayuga, ND

Subject: 2002 Annual Water Management Plan and 2001 Use Report

1. List of Water Rights

- ✓ **Water Right Filing No. 57:** Declaration of Filing dated September 1, 1934 claimed 104 surface acres, for 397 acre-feet storage and 312 acre-feet seasonal use for Clouds Lake (Pool 8) now called Hepi Lake from unnamed tributary to Wild Rice River. Listed on the same sheet as Lake Tewaukon/White Lake, as per RO(EN) Marshall Fox's 11-14-83 memo. Water use in pools 5 through 10 is covered under this right, with Hepi Lake to be drawn down to fill these pools.
- ✓ **Water Right Filing No. 64:** Declaration of Filing dated September 1, 1934, for Lake Tewaukon and East and West White Lake (including Cutler Marsh), 1417 surface acres, for 7198 acre-feet storage, 4251 acre-feet seasonal from Wild Rice River and unnamed tributary.
- ✓ **Permit #1261:** 4852 acre-feet storage and 2287 acre-feet seasonal use, for a total of 7139 acre-feet from the Wild Rice River for fish and wildlife use. This permit covers additional storage and seasonal use in Lake Tewaukon, Cutlers Marsh and West White Lake; 409 acre-feet seasonal use to replace water to be diverted from the watershed by Sargent County Water Conservation District project; and total storage and seasonal use for Pools 3 and 4. Priority date December 28, 1964.
- ✓ **Tewaukon NWR #1262:** 1,130 acre-feet yearly (635 acre-feet storage and 495 acre-feet seasonal use) for Sprague Lake, dated December 28, 1964, diversion from an unnamed creek in the SE1/4 NW1/4, Sec. 2.
- ✓ **Tewaukon NWR #1263:** 686 acre-feet yearly for Mann Lake (total of 236 acre-feet comprised of 107 acre-feet storage and 129 acre-feet seasonal use) and Horseshoe Slough (total of 450 acre-feet comprised of 270 acre-feet storage and 180 acre-feet seasonal use) dated December 28, 1964, diversion from the Wild Rice River.
- ✓ **Tewaukon NWR #3816 Nickeson Tract:** 571 acre-feet (474 acre-feet storage, 97 acre-feet annual use) for the Nickeson Bottoms, a tract jointly owned by the ND Game and Fish Department, US Bureau of Reclamation and US Fish and Wildlife Service (FWS). Diversion is from the Wild Rice River, W ½ Section 27, T. 130 N., LTL, R. 54 W. Priority date August 15, 1985. Received perfected water permit on August 14,

1997. Recorded in the Register of Deeds, Sargent County on March 3, 1998.

In December, the Service submitted an application for prescriptive water rights pursuant to the provisions of State Senate Bill No. 2182 for 859 acre feet.

2. Water Use - 2001

The year 2001 was a fairly "normal" year in terms of precipitation and temperatures. The average annual precipitation for southeastern North Dakota is 20 inches of rain and about 40 inches of snow.

Month	<u>Temperatures</u>		<u>Precipitation</u>	
	Low (Average)	High (Average)	Rain	Snow
January	8 *F	21 *F	0.07"	2.5"
February	11 *F	18 *F	1.18"	16"
March	32 *F	40 *F	0.22"	1"
April	49 *F	61 *F	3.57"	6"
May	63 *F	78 *F	0.98"	N/A
June	69 *F	84 *F	3.06"	N/A
July	72 *F	86 *F	3.53"	N/A
August	75 *F	88 *F	0.91"	N/A
September	65 *F	76 *F	2.38"	N/A
October	53 *F	64 *F	1.27"	N/A
November	46 *F	56 *F	0.96"	9"
December	31 *F	43 *F	0.24"	3"
Totals:	N/A	N/A	19"	38"

While normal winter precipitation was recorded in 2001/2002, water levels continued to maintain themselves due to existing water, rainfall and upstream water releases. There was however a slight drop in pool water levels as compared to last year. The Wild Rice River, LaBelle Creek, Frenier Dam Outlet and Sprague Lake Creek flowed above average this year, exceeding management levels in all wetlands. In March stoplogs were removed from Dam 1 to move water out of the system before a major spring thaw. The Wild Rice River continued a steady flow the entire year with high peaks at major rain events in June, July and September. Additional cleaning of the Crete-Cogswell drain in 1999, and 2000 plus several continuous high water years caused this increased flow in the Wild Rice River. In the early to mid-fall (August, September, October) very little to no precipitation fell causing drying of wetlands. Freeze up this year occurred on November 25. Descriptions of pool levels in this section are based on the existing gauges in the pools except where gauges do not exist then approximations are given from the pool elevation survey maps.

Pool 1 (Lake Tewaukon): In anticipation of spring runoff, boards were pulled from the lake March 21. Spring runoff caused the pool to peak at 1150.52 on April 15. Water levels continued to drop slowly to approximately 1145.8 on May 24 to allow contractors to complete the White Bridge replacement project. We began replacing boards May 29 to bring the lake level up to full pool of 1148. The lake froze up in early December at 1148.12.

Parker Bay (east end of Lake Tewaukon): Spring runoff from adjacent areas filled the pool to 3 feet. Flow was prevented from entering Parker's Bay from LaBelle Creek (stoplog structure). Average pool depth through out the year was at 3 feet. Waterfowl, especially mallards and tundra swans, continued to utilize this pool in the fall migration period.

Pool 2 (Cutler Marsh): Water was collected in Pool 2 to refill pool 1 after construction was completed on the White Bridge replacement. Pool 2 peaked at 1154.65 on May 30. Water was then released into Pool 1 until June 4 when boards were installed at 1150.95 to bring Pool 2 to management level of approx. 1154.5 on June 15. The pool froze at 1150.

Pool 2A: This pool began the spring at approximately 1154. However, due to dry weather and problems with the structure, the pool dropped all year to approximately 1150* at freeze up.

* Approximate water level readings are based on completed surveys of pool depths which were mapped for refuge use. This is the only reliable method available at this time. All pools are scheduled to have gauges set to mean sea level in 2000.

Pool 3 (Maka Pool): The elevation in Pool 3 rose from the freeze up elevation of 1153.15 in 2000 to an average of 1155 through out the year. Due to a dry fall, levels dropped to 1153 at freeze up.

Pool 3A: Spring runoff caused the pool to peak at 1155*. Due to dry weather, the level dropped throughout the year. At freeze up it was approximately 1153*.

Nickeson Bottoms: This pool breached in the spring of 2000 due to dike damage from muskrats. Through most of the year, it maintained the same elevation as Pool 3 (1153.15). The breach was repaired in October and freeze up level was 1152.8

Pool 4 (River Pool): Pool 4 peaked at 1162.2 on April 14 and then drained out to a management level of 1160 by April 25. Water level slowly lowered all summer due to dry weather until Oct. 21 when boards were pulled to freeze out carp and make room for spring run off. Freeze up occurred at 1158.

Pool 5: Dike repaired in fall of 2000 and filled with water to test dike. Dike held water for a week and was then drained to place rip rap. Rip rap was not placed in 2001. Pool 5 was dry at freeze up.

Pool 5A: Due to dry weather, Pool 5A dried up in late summer and was dry at freeze up.

Pool 6: Washed out around structure in early spring. Level was 1165 at freeze up.

Pool 7: Pool 7 started in the spring at 1173.05 and due to dry weather was lowered through the summer to 1170.3 at freeze up.

Pool 7A: Spring runoff was used to raise this pool to approximately 1177.25*. The Pool was at approximately 1175* at freeze up.

Pool 8 (Hepi Lake): East and north side structures were repaired by the DU contractor in the fall of 1998. Pool 8 peaked at 1177.85 on May 3. Spring runoff was moved into Pool 7a to maintain safe nesting habitat for the herons and egrets. Efforts were made to avoid excessive flow into Pool 9 to allow for vegetative growth in the constructed above ground outlet. Some flow was allowed but it was restricted to what would flow through the original outlet pipe. At freeze up the pool was approximately 1174.5*.

Pool 9: Both the inlet (from Pool 8) and the outlet of this pool were repaired in the fall of 1998. Freeze up depth in the winter of 2000 was 4 feet deep (1165*). From spring flows the pool peaked at 1170*. Efforts were made to avoid excessive flow to allow for vegetative growth in the constructed above ground outlet. The remainder of the year flows from Pool 8 were limited to what the original outlet pipe could handle. The original outlet pipe was damaged. The Pool was pumped down to 1165 to repair the outlet pipe. This maintained the pool at approximately 1165* through freeze up.

Pool 10: Efforts were made to reduce inflows to this pool through the structure (no adding or subtracting of water). As a result it only increased slightly and then dropped due to evaporation. The pool was maintained at 1173* through the year into freeze up.

Pool 11 (West White Lake): This pool peaked at 1152.62 on April 30. One board was removed June 4 to help stabilize County road 5 on the south side of the pool. Due to our dry fall, by freeze up Pool 11 was at 1149.80.

Pool 12 (East White Lake): Pool 12 received local run off from Pool 11 most of the summer. Addition water was moved out of the pool through evaporation. This pool has no vegetation except along a few edges. It also has developed severe erosion in some areas. The only wildlife to use this pool are pelicans, cormorants and great blue herons. By freeze up Pool 12 was at 1147.50.

Pool 13 (Mann Lake): Spring runoff filled the pool to 1209 and evaporation had lowered it to 1207 by freeze up.

Pool 14 (Sprague Lake): The lake peaked at 1218 and overflowed its banks in two areas east and west of the structure. This structure is scheduled to be replaced in 2002. It was stabilized at 1214 and evaporated to 1212.85 at freeze up.

Pool 16 (Horseshoe Slough Group): These pools have very small elevation changes between them and several structures are nonfunctioning making it difficult to move water through them. River water was kept out of the unit to avoid raising the pools. When the water level dropped in the Wild Rice River, all Pools were lowered a small amount by backing water through "A" dike into the Wild Rice River. Average pool depth through out the year was approximately 1207*. The pools in the Horseshoe Slough Unit saw high numbers of broods due to the good ratio of open water to cattails. They also provided shallow feeding areas for broods. At freeze up these pools were at approximately 1206*.

3. Impoundment Data

Please see the attached chart for capacities for each pool at various elevations. No formal inflow/outflow records were maintained. There are currently no functional gauges on pools that relate to mean sea level.

Please see Section #2 above for elevation changes for the various pools.

4. 2002 Plans

The following plans for the water levels in the pools are the best levels for attaining management objectives including planned construction on Sprague Lake and Tewaukon Lake. All efforts will be made to manage pool levels at desired elevations without incurring additional damage to dikes from high water or impacting other landowners. On one additional pool (Pool 5) invertebrate samplers have been installed for monitoring of wetland response to draw downs and to give managers a tool in knowing when a specific pool is in need of a draw down. Plans to install them last year failed when the pool would not hold water. Two previous pools (Pool 2a and 13) had samplers installed in 1998. We still have plans to install data loggers and staff gauges to all pools to aid in monitoring of water use.

Pool 1 (Lake Tewaukon): Pool 1 may be drawn down again in the spring to facilitate the construction of the shore line stabilization on the west side of the lake, unless sufficient water can be stored upstream to facilitate quick recovery. The elevation may be dropped to 1146 during the construction phase then raised as soon as possible to maintain the lake water level at 1148. This elevation will help to maintain a large open water area for migrating waterbirds which will also benefit the sport fishery habitat. After all projects are completed the pool will be raised from water held in Pool 2, 3, and 4 to provide for the normal 1148 lake elevation.

Parker Bay (east end of Lake Tewaukon): If possible, lower to maintain a 2½-3 foot depth for waterfowl production.

Pool 2 (Cutler Marsh): This pool will be dropped early to facilitate the removal of water from South Pool 2, East and West White Lakes as the Wild Rice spring flows will allow. Then the level will be raised and maintained at 1154.5 to store water for Pool 1. Once the Pool 1 construction projects have been completed, water will be moved into Pool 1 to provide for migrating waterbirds and overwintering of the fishery.

Pool 2A: Maintain at a water level of approximately 1153. A guide for this level will be the stake indicating the best level for invertebrate monitoring. This will allow a 4 foot water depth for brood use. Invertebrate samplers will continue to collect invertebrates during the year. Structure should be replaced if conditions allow.

Pool 3 (Maka Pool): Maintain pool at 1156 to store limited water for Pool 1 and reduce backflows from Pool 2. If needed, supply water to Pools 2A and 3A. Once the Pool 1 construction projects have been completed move water into Pool 1 (through Pool 2) to provide for migrating waterbirds and overwintering of the fishery.

Pool 3A: The pool will be filled to a level of 1156 for brood use. If needed obtain water from Pool 3 during spring flows.

Nickeson Bottoms: If possible, we will keep inflows to a minimum and allow evaporation to take the water down to 1150.

Pool 4 (River Pool): Maintain approximately 1160 to store water for Pool 1. Monitor water to ensure no impacts to the adjacent landowner. For duck nesting, especially overwater nesting, stabilize water level as quick as possible before April 15. Once the Pool 1 construction projects have been completed move water into Pool 1 to provide for migrating waterbirds and overwintering of the fishery.

Pool 5: In the spring riprap will be added to the dike to avoid future problems with muskrat holes. After the riprap placement the pool will be raised to 1162. Water placed on the existing vegetation should provide a flush of invertebrates for brood use. After the initial flush of sediments the invertebrate samplers will be installed. Maintain the pool at a level of 1162.

Pool 5A: Allow to fill 3-4 feet (elevation 1164) with water diverted from Hepi Lake.

Pool 6: Dike is currently breached. We will be repairing as soon as possible and moving water in order to maintain a level of 1167.

Pool 7: Maintain at a level of 1174. Current density of cattail makes excellent cover for northern harriers, marsh wrens, bitterns, and red-winged blackbirds.

Pool 7A: Divert water from Hepi Lake during spring runoff to fill to a maximum depth to flood cattails and maintain water through out the summer (elevation 1178 minimum). The pool will dry out rapidly through an average summer due to the evaporation of its large surface area. For Pool 7A's active rookery, water levels should be managed to keep 3 feet of water in the pool throughout the summer and fall. Also maintain sufficient water to avoid a botulism problem (which occurred in 1999 due to structure failure).

Pool 8 (Hepi Lake): Control structures on the north and east ends were repaired in Dec 1998. As spring runoff increases the pool level, water should be diverted to fill Pools 5, 5A, 6, 7 and 7A (with 5 and 7A as the priorities). If excess water exists after filling these pools water should be diverted out of 7A through its north structure. Pool 8 should be lowered to 1170 to increase the vegetation in the pool.

Pool 9: If possible maintain a 2 - 3 foot level in this pool (no greater than 1164.5) to allow for vegetative growth around the edges.

Pool 10: Lower to a depth of 2 ½ feet (1173.5") to encourage submergent vegetation growth to maintain its highest use as a semi-permanent wetland.

Pool 11 (West White Lake): Maintain depth at 4 to 4 ½ feet to slow cattail invasion. If necessary pump water to Pool 12 to keep from flooding County Road 5. Maximum level should be 1150 for cattail control and no higher than 1151.50 to reduce impacts to County Road 5. To allow drop in East White Lake, block structure after spring runoff.

Pool 12 (East White Lake): Add no water to this pool unless there is a need to pump water from Pool 11 to protect County Road #5. If feasible allow this pool to drop to as low as possible. Try to move water into Pool 2 especially during the early spring or late summer filling of Pool 1. Allow gradual drying to reestablish cattails and to reduce bank erosion.

Pool 13 (Mann Lake): Maintain at current elevation (1207") to allow for vegetative growth and invertebrate monitoring. Do not allow the river to flow into the pool. Invertebrate sampling will continue through the year.

Pool 14 (Sprague Lake): Maintain maximum pool, about 8 ½ to 9 feet in order to maintain a large open water area for migrating waterbirds which will also benefit the sport fishery. If flood project is to begin this summer there may be a need to reduce the water level.

Pool 16 (Horseshoe Slough): Water levels in these pools will be managed to best facilitate construction in the and rehabilitation of dikes during 2002 construction season.

5. Location Map

Please see attached Refuge Map on which all management pools are marked.

Submitted By:

Douglas W. Staller
Refuge Manager

Date: 2-27-02

Reviewed By:

Bob Stupp

Date: 3/14/02

Approved By:

Tom E. Hoffman

Date: 3/26/02

Concurrence:

Chris Curless

Date: 3-19-02

Attachments

TEWAUKON NATIONAL WILDLIFE REFUGE
Pools, Elevations and Acres

Pool No. & Name	January 1, 2001			December 31, 2001		
	Elevation	Surface Acres *	Volume (acre ft.)*	Elevation	Surface Acres *	Volume (acre ft.)*
Pool 1 - Tewaukon	1147.94	1059	8311	1148.12	1061	8502
- Parker's Bay	1146.00	70	133	1145.00	61	67
Pool 2 - Cutler's Marsh	1148.60	214	499	1150	247	826
Pool 2A	1154	29	99	1150	12	5
Pool 3 - Maka Pool	1153.15	76	184	1153.	74	172
Pool 3A	1156	15	34	1153	5.03	4.39
Nickeson Bottoms	1153.15			1152.80		
Pool 4 - River Pool	1157.80	66	114	1158	71	127
Pool 5	1156	0	0	1155.50	0	0
Pool 5A	1164	9	16	1160	0	0
Pool 6	1166	3.34	2.63	1165	1	.5
Pool 7	1173.75	21	53	1170.30	6	4
Pool 7A	1174	17	7	1175	35.93	31.91
Pool 8 - Hepi Lake	1175	101	455	1174.5	96	405
Pool 9	1165	10	25	1165	10	25
Pool 10	1174	6	12	1173	5	7
Pool 11 - West White Lake	1150	72	174	1149.80	69	160
Pool 12 - East White Lake	1147	98	390	1147.50	100	439
Pool 13 - Mann Lake	1206	44	118	1207	46	164
Pool 14 - Sprague Lake	1212	184	1250	1212.85	189	1409
Pool 16 - Horseshoe Slough						
- Pool 1 (A Pool)	1207	41.16	39.27	1206	16	10
- Pool 2 (B Pool)	1207	50	167	1206	44	120
- Pool 3 (C Pool)	1207	11	41	1206	10	30
- Pool 4 (B West)	1207	51	163	1206	45	115
- Pool 5 (B North)	1207	31	60	1206	23	32
- Pool 6 (C North)	1207	8.57	7.22	1206	4	1
- Pool 7 (C South & C East)	1207	21.83	50.77	1206	17	31

*1998-99 Pool acreages and volumes that were taken from a table calculated from information gathered during recently completed surveys of pool depths which were mapped for refuge management purposes. There are currently no functional gauges on pools that relate to mean sea level. Whole numbers (i.e. 27) are from expanded area tables from data collected in 1997.

WATER USE REPORT/MANAGEMENT PLAN
SHORT FORM

Storm Lake NWR, Sargent County
Station Name

Summer, 2001
Date Of Inspection

Declaration of Filing: 8/30/37
Water Right No.

Drainage ditch (legal)
Source(s)

Several
(522 acre-feet storage)
(900 acre-feet seasonal)

Means of Diversion Uncontrolled
Rate Unknown

Water Diverted: Yes___ No X

Water Level est 654 acre-feet
(Elevation or Est. Storage Amount)

*Impoundment(s): Yes___ No X

*Well(s):
Free Flowing none gpm
Pumped _____ gpm

Type of Use:
Surface Irrigation _____
(Crop) _____
Fish & Wildlife X Virtually no public use
Stock _____
Domestic _____
Other _____

Overall Climatic Conditions: 2001 was another moderately wet year. The legal drain and diversion ditch maintained the lake level only after the snow and ice melted.

Condition of Facilities: A diversion dam at the head of the feed ditch serving Storm Lake washed out well before 1976. Apparently someone decided it wasn't worth repairing. The town dug a ditch beside the existing structure to allow for flood waters to move out of the town. At the end of 1997 the town placed a culvert with flap gate at an agreed elevation by a special use permit with the refuge manager. The culvert is well above the existing structure and will allow flood waters to be move out with out impacting the water right. The ditch through the golf course was also cleaned in 1997 through a special use permit to facilitate removal of flood waters. At that time the Golf Course placed 2 new bridges on the fee title property with out notification of the refuge. An agreement with the Service was signed to mitigate the mowing of the fee title property with no mow areas along the golf course edges for wildlife was signed in 1999. A right-of-way for the four bridges is still in progress.

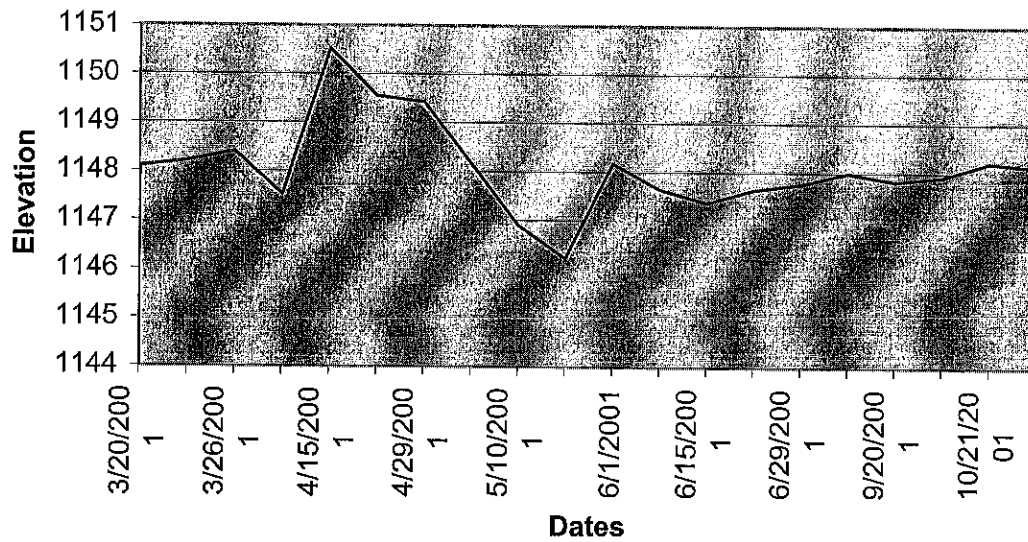
Proposed Water Program: No water management capability is present. Water runs down the ditch into the lake to an unknown degree each spring. Water did fill Storm Lake in 1993. Current high waters and overland flooding have resulted in the feeder ditch becoming an outlet for the water in Storm Lake into the legal drain.

Comments: The lake serves as an excellent waterfowl loafing sanctuary with good use by snow geese, canvasbacks, redheads, lesser scaup, and tundra swans. Water levels fluctuate on their own. If active management was initiated, some degree of improvement might be gained by a cycle of draw down management. It is questionable if the benefits would be worth the costs for Storm Lake alone. However, when you look at the other three wetlands to the south we should continue to work with Ducks Unlimited and put the Mini Joint Venture back on tract. The Golf Course Association of Milnor which at one time requested lake water to irrigate portions of the Storm Lake Golf Course has found a well water source. The Association was granted a conditional water right, junior to that of the FWS.

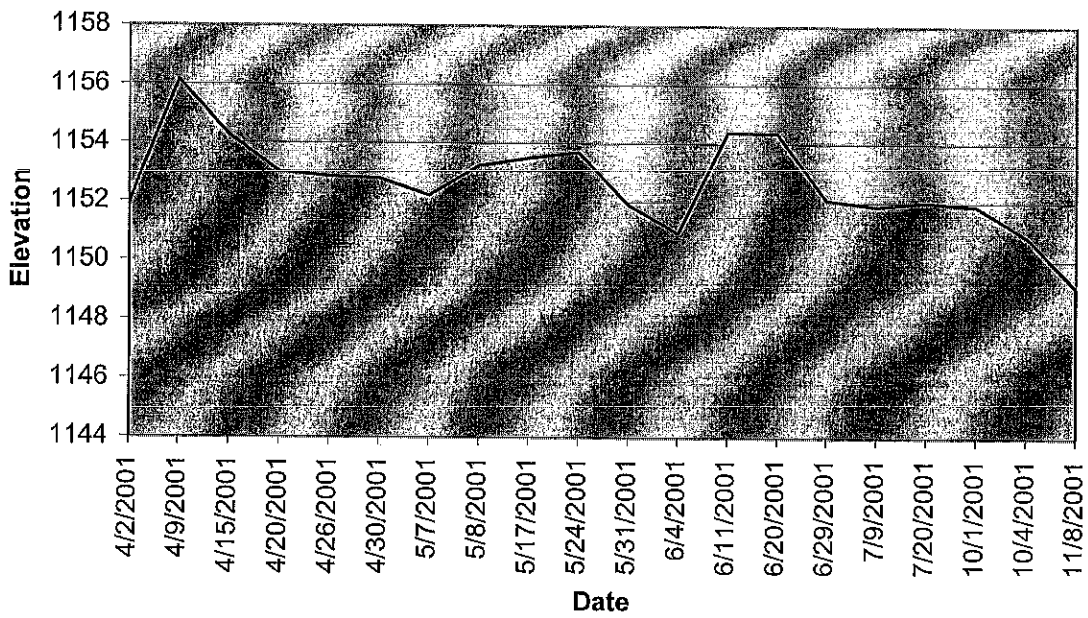
Douglas Staller, Refuge Manager

Date

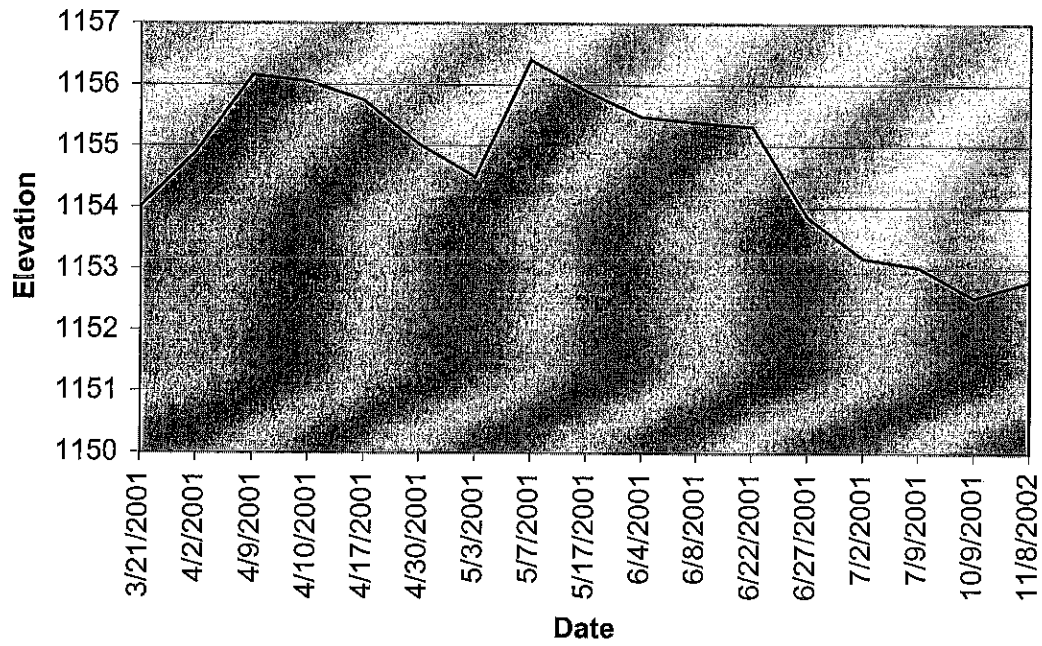
Lake Tewaukon



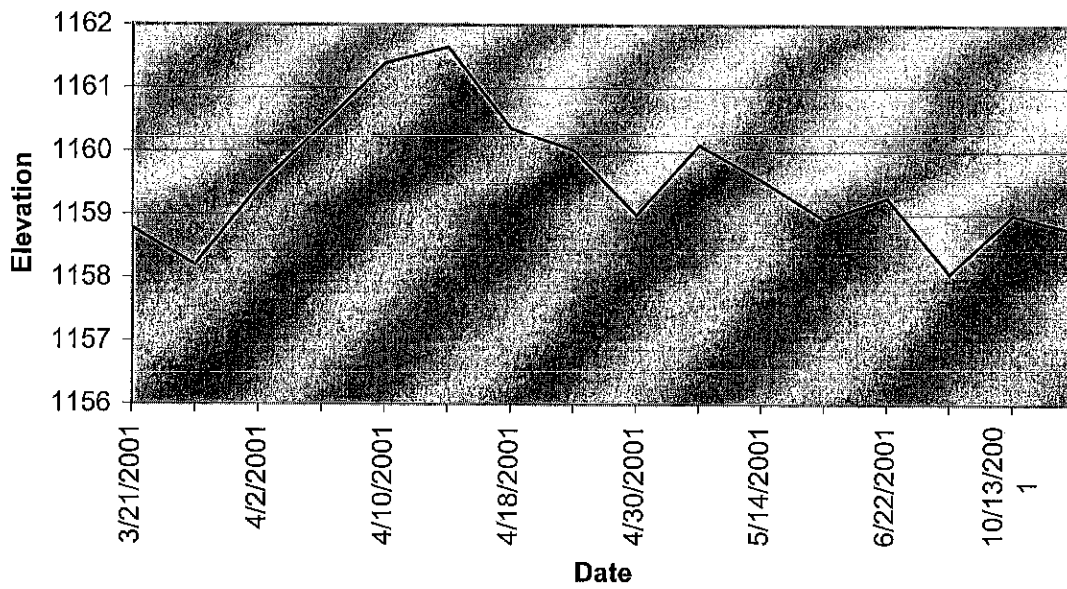
Cutler's Marsh



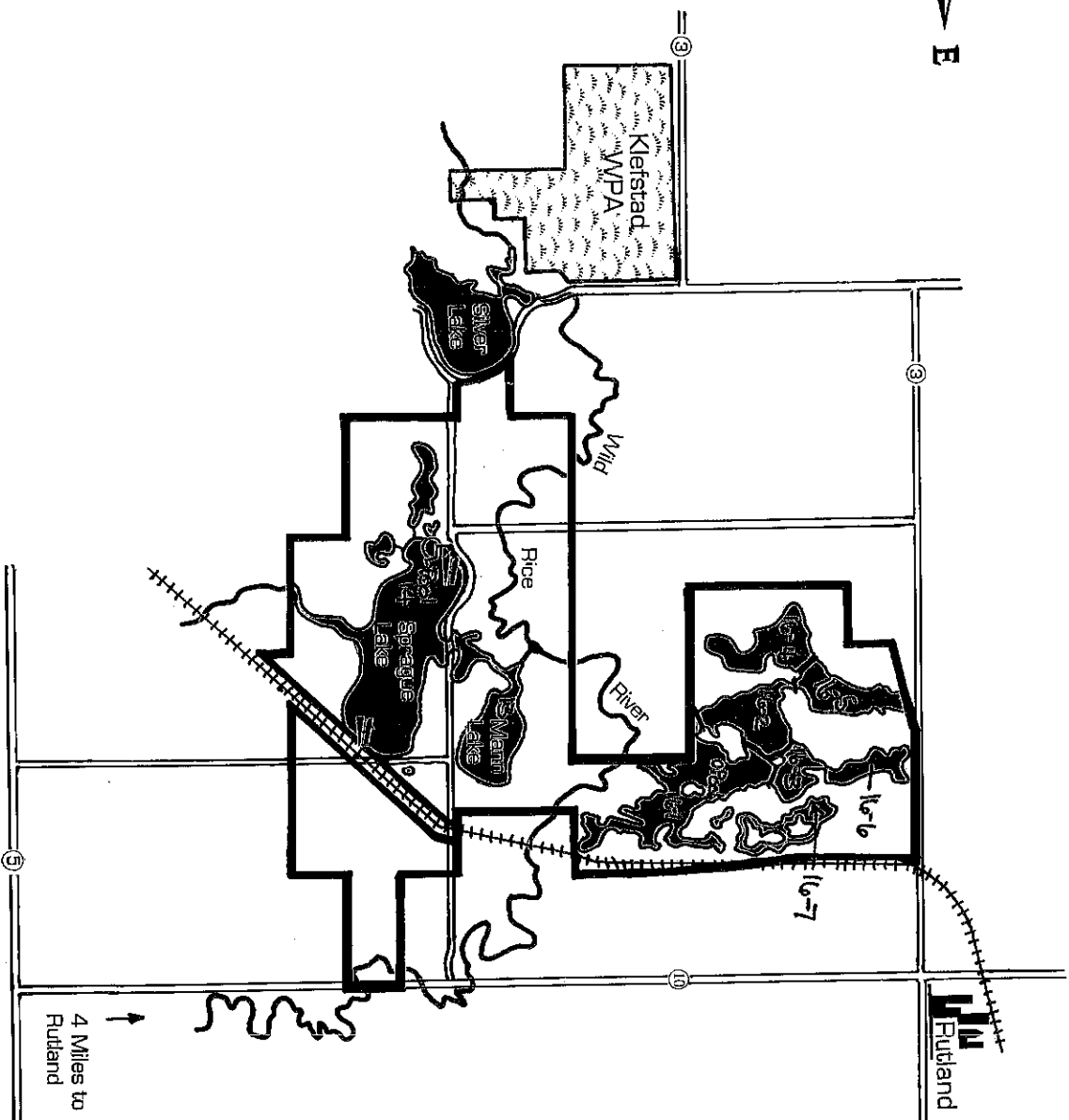
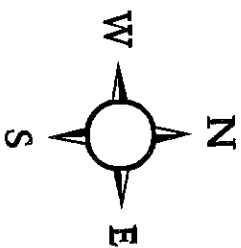
Pool 3 - Maka Pool



Pool 4 - River Pool



Sprague Lake Unit



4 Miles to
Rutland

Scale in Miles
0 1/4 1/2 3/4 1